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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/818,575	03/28/2001	Zvi Yona	P-3068-US	3666
27130	7590	03/16/2004	EXAMINER	
EITAN, PEARL, LATZER & COHEN ZEDEK LLP 10 ROCKEFELLER PLAZA, SUITE 1001 NEW YORK, NY 10020			CHANG, AUDREY Y	
			ART UNIT	PAPER NUMBER

2872

DATE MAILED: 03/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/818,575

Applicant(s)

YONA ET AL.

Examiner

Audrey Y. Chang

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Remark

- This Office Action is in response to applicant's amendment filed on December 3, 2003, which has been entered.
- By this amendment, the applicant has amended claims 1, 5-7, 9-10, 14-19 and has newly added claims 24-32.
- Claims 1-32 remain pending in this application.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. **Claims 6, 9, 15, 16 and 18 and newly added claims 24 and 27 are rejected under 35 U.S.C. 112, first paragraph**, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification and the claims fail to teach how could the redirecting unit being a *polarization selective* reflective device that is capable of "directing at least said first and second images to at least first and second respective spatial region of a reflecting unit". Clarifications are required. It is known in the art that a polarization selective reflective device to the most can only reflect light with one particular polarization state; it will not be able to *redirect* light along common optical axis, (as required by the amended claims 1, 10 and 19) into different directions. Furthermore, the polarization selective reflective device can only reflect "polarized light" where no such feature is being defined in the claims for the image, this therefore makes the apparatus not enabling. The applicant is respectfully noted that

Art Unit: 2872

polarizability is different from reflectivity. Polarizability along will not be able to reflect light of different polarization to different spatial regions.

The specification and claims also fail to teach how could an image source is capable of generation spatial complementary image that are of different wavelength or of different polarization. **Certain essential elements, that are critical, are needed to achieve such features.**

The specification and the claim fail to teach how could a wavelength sensitive device can work as the redirecting unit. The claims fail to teach the wavelength property of the images to make the “wavelength sensitive device” workable in the apparatus claimed. The specification and the claims also fail to teach how could it be by simply having “wavelength sensitive” the redirecting unit is capable of directing first and second complementary images to different spatial location, according to wavelength. Color coding in general will not give different reflection direction.

Clarifications are required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1-7, 10-15, 19-23 and newly added claims 24-29 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Morishima et al (PN. 5,589,956) in view of the patent issued to Popvich (PN. 6,082,862).**

Morishima et al teaches an image display apparatus that is comprised of a plurality of image display elements (1-1, 1-2 of Figure 10) together serve as *an image source* for generating at least a first

Art Unit: 2872

and second *partial images* (14-1 and 14-2) that serve as the *first and second complementary image*. The image display apparatus further comprises a holographic optical element (HOE 2a, Figure 10) that serve as the *redirecting unit* that is coupled to the image source to direct the at least first and second complementary images to a *first and second spatial region*, respectively, of a *reflective* holographic optical element (HOE 2b), serves as the reflecting unit, whereby the first and second spatial image fractions are formed and viewed by an observer as an *integrated single image*, (please see Figures 10-11, column 2 lines 50-65, and column 9, line 27 to column 10).

This reference has met all the limitations of the claims with the exception that it does not teach *explicitly* to use a relay optics, however as demonstrated by Figure 10, Morishima et al teaches that each of the complementary images is directed to specific location of the redirecting unit (HOE2a) which implicitly suggests certain kind of the relay optics with associated field of view is used to direct the complementary images. It also would have been obvious to one skilled in the art to utilize a relay optics having associated field of view with the image fraction, if such is not the case in the cited reference, to allow the complementary images be directed to the proper locations of the redirecting unit which further be directed to the proper spatial location of the reflecting unit for the benefit of providing more accurate high resolution image display of the composite or integrated image. Furthermore, as demonstrated by the Figure 10, the field of view defined by the reflecting holographic optical element is larger than the image field of view relayed from the image source, (8-1, 8-2).

Claims 1, 10 and 19 have been amended to include the feature that the complementary images are produced along a common optical axis. Morishima et al does not teach such explicitly. **Popvich** in the same field of endeavor teaches an image projection system wherein a single image source that generates a plurality of complementary images along a **common** optical axis. The complementary images are then being projected to different spatial regions of a display screen, (please see Figure 2). It would the have been obvious to modify the Morishima et al accordingly for the benefit of using a single image

Art Unit: 2872

generating source that generates image portion along a common axis as desired to reduce the size of the image source.

With regard to claims 2-4, 11-13, and 20-23, Morishima et al teaches that the reflecting unit is a holographic optical element (HOE2b, Figure 10) which is a *diffractive* optics having optic power for converging the complementary images to form a composite or integrated image. Although this reference does not teach explicitly that the holographic optical element is a binary optics such feature is either inherently met by the disclosure or an obvious modification to one skilled in the art for the benefit of providing an alternatively well known type of diffractive element that have good diffraction efficiency. Morishima et al teaches that the image display apparatus could be applied as *head mount display*, which implicitly requires the observer being capable of viewing the surrounding scene also. Although this reference does not teach explicitly to make the power of the holographic optical element to have zero optical power for surrounding scene by providing a corrector hologram, however such practice is standard in the art for the benefit stated above, such modification would therefore have been obvious to one skilled in the art.

With regard to claims 6 and 15, although this reference does not teach explicitly that the complementary images are of different wavelength however such modification is rather obvious by simply using color filter to make the complementary images with different color code. Such modification would therefore have been obvious to one skilled in the art to provide different color design to the integrated and composite image.

With respect to newly added claims 24, 27 and 31, Morishima et al does not teach explicitly that the redirecting holographic optical elements are wavelength sensitive or the redirecting is based on wavelength. However *it is very well known* in the art that a holographic optical element is in general *wavelength selective* or *sensitive*, namely it will **only** diffract light having the same wavelength as the wavelength of the light used to record the holographic optical element. It is therefore either inherently

Art Unit: 2872

true or an obvious modification to one skilled in the art to have the redirecting holographic optical element redirect image light based on wavelength for the benefit of creating colorful integrated image.

With regard to newly added claims 25 and 28, Morishima et al teaches that the complementary images are not overlapping, (please see Figure 10). With regard to newly added claims 26, 29 and 32, Morishima et al does not teach explicitly that the complementary images are generated sequentially. Popvich does teach that the complementary images may be generated sequentially. It would then have been obvious to one skilled in the art to modify the image source of Morishima to use one image source that sequentially generate the complementary images for the benefit of reducing the size of the image source and therefore the display device.

5. Claims 1, 8, 10 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Florence et al (PN. 5,652,666).

Florence et al teaches a *holographic display system* that is comprised of a *spatial light modulator* (14, Figure 4), for generating a plurality of stripes of image representing a hologram, that serves as the *at least first and second complementary images*, with no significant portions being overlapped with each of the stripe of images, (please see Figure 4). The display system further comprises a set of lenses (41-43) serves as the **relay optics** with associated field of view for directing the complementary images to a scanning mirror (45) that is rotatable for redirecting the stripes of image to a cylindrical lens (44) to form an integrated hologram image at an image plane (46). This reference has met all the limitations of the claims with the exception that it does not teach explicitly to use a reflecting unit as the means for forming the integrated image. However to use a transparent lens or a reflective mirror for converging image light to form image is rather well known in the art such modification would have been obvious to one skilled in the art for the benefit of providing a different and more compact optical design to the display system.

Art Unit: 2872

Claims 1 and 10 have been amended to include the feature that the complementary images are produced along a common optical axis, Florence et al discloses such as shown in Figures 1 and 4.

6. **Claims 1, 6, 7, 10, 14-15, 19, 24-29 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to the patent issued to Popvich (PN. 6,082,862).**

The amendments to claims 1, 10 and 19 and the newly added claims 24-29 and 31-32 necessitate this new ground of rejection.

Popvich teaches an *image projection system* that is comprised of an *image generator* (28, Figures 2 and 5), serves as the *image source*, that produces a *plurality of image segments* serves as the *plurality of complementary images sequentially along a common optical axis*. The complementary images are projected through a holographic redirecting unit (34, 36, 38, 40 or 78, 80, 82, 84, 86, 88, 90, 92) including certain relay optics having associated field of view (as shown in Figure 5) to different spatial regions (42, 44, 48 and 48) of a screen (32) to form the composite or integrated image on the screen that have a larger field of views than the associated field of view of the relay optics (please see the abstract, column 1, lines 18-24, columns 6-9). Popvich teaches that the redirecting unit includes a stacked of switchable holograms that each directs image light based on color information to different spatial regions of the screen.

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the screen is reflective. However the reflection property and transmission property of the screen do not effect the operation of the image projection system. A reflective screen is equally well known in the art as a transmissive screen. To replace the transparent screen with a reflective screen would have been obvious to one skilled in the art for the benefit of make the image projection system more compact in size.

Art Unit: 2872

7. Claims 2-4, 11-13 and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Popvich as applied to claims 1 and 10 above, and further in view of the patent issued to Morishima et al (PN. 5,589,965).

The image projection system taught by Popvich as described for claims 1 and 10 above has met all the limitations of the claims. This reference however does not teach explicitly that the projection screen is a diffractive optical element. Morishima et al in the same field of endeavor teaches to use a reflective holographic optical element (2b, Figure 10) as a reflective screen for directing and projecting the complementary image to observer to form an integrated image. It would then have been obvious to one skilled in the art to apply the teachings of Morishima to modify the image projection system to use holographic optical element, (which is a form of diffractive optical element) as the reflecting screen for the benefit of more accurately directing and forming the integrated image to the observer, (holographic optical element is known in the art to have more accurate optical property). Although this reference does not teach explicitly that the holographic optical element is a binary optics such feature is either inherently met by the disclosure or an obvious modification to one skilled in the art for the benefit of providing an alternatively well known type of diffractive element that have good diffraction efficiency. Morishima et al teaches that the image display apparatus could be applied as *head mount display*, which implicitly requires the observer being capable of viewing the surrounding scene also. Although this reference does not teach explicitly to make the power of the holographic optical element to have zero optical power for surrounding scene by providing a corrector hologram, however such practice is standard in the art for the benefit stated above, such modification would therefore have been obvious to one skilled in the art.

Double Patenting

8. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894);

Art Unit: 2872

In re Ockert, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

9. Applicant is advised that should claim 5 be found allowable, claim 7 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Response to Arguments

10. Applicant's arguments with respect to claims 1-32 have been considered but are moot in view of the new ground(s) of rejection. The newly amended claims and newly added claims have been fully considered and they are rejected for the reasons stated above.

11. Applicant's arguments are mainly based on the newly amended and newly added claims and they have been fully addressed in the paragraphs above.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

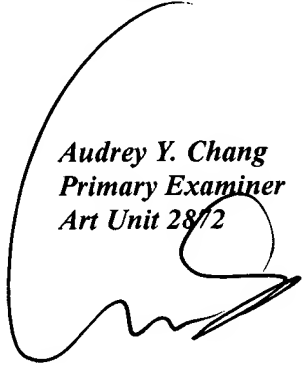
Art Unit: 2872

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



*Audrey Y. Chang
Primary Examiner
Art Unit 2872*

A. Chang, Ph.D.